

# **METAL CUTTING BAND SAW**

**Model: BS-912B BS-912G BS912R**

**BS-912GR BS-912GDR**



**Operation Manual**

## **WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY**

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result. This machine was designed for certain applications only. We strongly recommend that this machine not be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application do not use the machine until you contact with us and we have advised you.

**You machine might not come with a power socket or plug. Before using this machine, please do ask your local dealer to install the socket or plug on the power cable end.**

### **SAFETY RULES FOR ALL TOOLS**

#### **A. User**

- (1). Wear proper apparel. No loose clothing, gloves, rings, bracelets, or other jewelry to get caught in moving parts.
- (2). Always wear eye protection. Refer to ANSLZ87.1 standard for appropriate recommendations. Also use face dust mask if cutting operation is dusty.
- (3). Don't overreach. Keep proper footing and balance at all times.
- (4). Never stand on tool. Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.
- (5). Never leave tool running unattended. Turn power off. Don't leave tool until it comes to a complete stop.
- (6). Drugs, alcohol, medication. Do not operate tool while under the influence of drug, alcohol or any medication.
- (7). Make sure tool is disconnected from power supply. While motor is being mounted, connected or reconnected.
- (8). Always keep hands and fingers away from the blade.
- (9). Stop the machine before removing chips.
- (10). Shut-off power and clean the BAND SAW and work area before leaving the machine.

#### **B. Use of machine**

- (1). Remove adjusting keys and wrenches. Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it "on".
- (2). Don't force tool. It will do the job better and be safer at the rate for which it was designed.
- (3). Use right tool. Don't force tool or attachment to do a job for which it was not designed.
- (4). Secure work. Use clamps or a vise to hold work when practical. It's safer than using your hand to operate tool.
- (5). Maintain tools in top condition. Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- (6). Use recommended accessories. Consult the owner's manual for recommended accessories.

The use of improper accessories may cause hazards.

- (7). Avoid accidental starting. Make sure switch is in "OFF" position before plugging in power cord.
- (8). Direction of feed. Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
- (9). Adjust and position the blade guide arm before starting the cut.
- (10). Keep blade guide arm tight. A loose blade guide arm will affect sawing accuracy.
- (11). Make sure blade speed is set correctly for material being cut.
- (12). Check for proper blade size and type.
- (13). Stop the machine before putting material in the vise.
- (14). Always have stock firmly clamped in vise before starting cut.
- (15). Ground all tools. If tool is equipped with three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter lug must be attached to a known ground. Never remove the third prong.

#### **C. Adjustment**

Make all adjustments with the power off. In order to obtain the machine precision and correct ways of adjustment while assembling, the user should read detailed instruction in this manual.

#### **D. Working environment**

- (1). Keep work area clean. Cluttered areas and benches invite accidents.
- (2). Don't use in dangerous environment. Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well-lighted.
- (3). Keep children and visitors away. All children and visitors should be kept at safe distance from work area.
- (4). Don't install & use this machine in explosive, dangerous environment.

#### **E. Main tenance**

- (1). Disconnect machine from power source when making repairs.
- (2). Check damaged parts. Before further use of the tool, a guard part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
- (3). Disconnect tools before servicing and when changing accessories such as blades, bits, cutters, etc.
- (4). Make sure that blade tension and blade tracking are properly adjusted.
- (5). Re-check blade tension after initial cut with a new blade.
- (6). To prolong blade life always release blade tension at the end of each work day.
- (7). Check coolant daily. Low coolant level can cause foaming and high blade temperatures. Dirty or week coolant can clog pump, cause crooked. Cast low cutting rate and permanent blade failure. Dirty coolant can cause the growth of bacteria with ensuing skin irritation.
- (8). When cutting magnesium never use soluble oils or emulsions (oil-water mix) as water will greatly intensify any accidental magnesium chip fire. See your industrial coolant supplier for specific coolant recommendations when cutting magnesium.
- (9). To prevent corrosion of machined surfaces where a soluble oil is used as coolant, pay particular attention on wiping dry the surfaces where fluid accumulates and does not evaporate quickly, such as between the machine bed and vise.

### F. Specified usage

This machine is used only for general cutting within the range of cutting capacity.

### G. Noise

A weighted sound pressure level: 80 dB

### H. Safety device

By the time the saw arm cover is opened, the interlock switch will function to stop the machine, do not remove this switch from machine for any reason, and check its function frequently.

## SPECIFICATION

Item No.	388010		388011		
Model	BS-912B		BS-912G		
Capacity	Circular	@90°	229mm(9")	229mm(9")	
	Rectangular	@90°	178 × 305mm(7" × 8.25")	178 × 305mm(7" × 8.25")	
	Circular	@45°	150mm(6")	150mm(6")	
	Rectangular	@45°	127 × 150mm(5" × 6")	127 × 150mm(5" × 6")	
Blade speed	@60Hz	32,60,88,115MPM		38,78,115MPM	
	@50Hz	26,50,73,95MPM		31.65,95MPM	
Blade size	27 × 0.9 × 2655mm		27 × 0.9 × 2655mm		
Motor power	1.1kW 1.5HP(3PH), 1.5kW 2HP(1PH)				
Drive	V-belt		Gear		
Packing size	158 × 62 × 115cm		158 × 62 × 115cm		
N.W./G.W.	230/260kg		200/250kg		
Item No.	388012		388113	388114	
Model	BS-912GR		BS-912GDR	BS-912R	
Capacity	Circular	@90°	229mm(9")	229mm(9")	229mm(9")
	Rectangular	@90°	178 × 305mm(7" × 12")	178 × 305mm(7" × 12")	178 × 305mm(7" × 12")
	Circular	@45°	150mm(6")	150mm(6")	150mm(6")
	Rectangular	@45°	127 × 150mm(5" × 6")	127 × 150mm(5" × 6")	127 × 150mm(5" × 6")
Blade speed	@60Hz	38,78,115MPM		38,78,115MPM	38,78,115MPM
	@50Hz	31,65,95MPM		31,65,95MPM	31,65,95MPM
Blade size	27 × 0.9 × 2655mm		27 × 0.9 × 2655mm	27 × 0.9 × 2655mm	
Motor power	1.1kW 1.5HP(3PH), 1.5kW 2HP(1PH)				
Drive	Gear		Gear	Gear	
Packing size	160 × 60 × 115cm		160 × 60 × 115cm	160 × 60 × 115cm	
N.W./G.W.	220/280kg		230/280kg	230/280kg	

## TRANSPORTATION OF MACHINE

### Unpacking

- (1). Transportation to desired location before unpacking, please use lifting jack. (Fig. B)

- (2). Transportation after unpacking, please use heavy duty fiber belt to lift up the machine.

ALWAYS KEEP PROPER FOOTING & BALANCE WHILE MOVING THIS MACHINE.

As this machine has heavy weight, it is recommended that the machine shall be transported with help of lifting jack.



Fig B

**Transportation Recommendation**

- (1). Tighten all locks before operation.
- (2). Always Keep proper footing & balance while moving this heavy machine, and only use heavy duty fiber to lift the machine as Fig. A
- (3). TURN OFF the power before wiring, & be sure machine in proper grounding, overload & circuit breaker is recommended for safety wiring.
- (4). Check carefully if the saw blade is running in counter-clockwise direction or not, reverse the wiring per circuit diagram then repeat the running test.
- (5). Keep machine always out from sun, dust, wet, raining area.

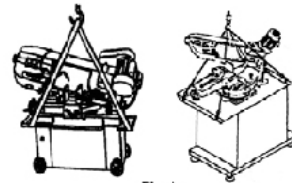
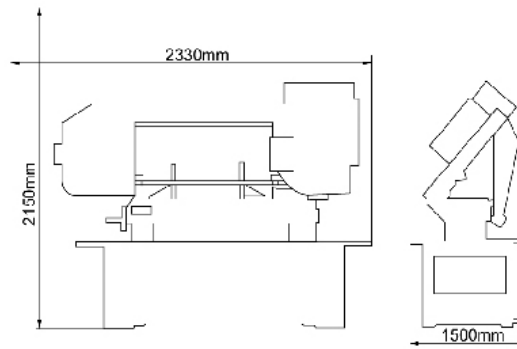


Fig A

912(B.G)

912(DR.GDR)

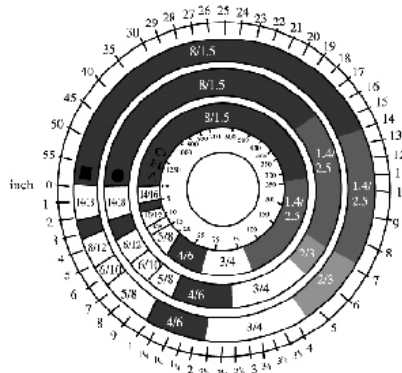
**MINIMUM ROOM SPACE FOR MACHINE OPERATION**



**MAKE PROPER TOOTH SELECTION**

For maximum cutting efficiency and lowest cost per cut, it is important to select the blade with the right number of teeth per inch (TPI) for the material being cut. The material size and shape dictate tooth selection. TOOTH SELECTION

You need to consider



- (1). The width of the cut. That is the distance in the cut that each tooth must travel from the point it enters the workpiece until it leaves the workpiece.
- (2). The shape of the workpiece.

● **Squares, Rectangles, Flats (Symbol :■)**

Locate the width of cut on the chart. (Inches on the outer circle and millimeters on the inner circle.) Select the tooth pitch on the ring marker with the square shape which aligns with the width of cut.

EXAMPLE: 6" (150mm) square, use a 2/3 Vari-Tooth.

● **Round Solids (Symbol :●)**

Locate the diameter of your workpiece on the chart. Select the tooth pitch on the ring marked with the round shape which aligns with the size of stock you are cutting.

EXAMPLE: 4" (100mm) round, use a 3/4 Vari-Tooth.

● **Tubing, Pipe, Structural (Symbol: ○ H ^ )**

Determine the average width of cut by dividing the area of the workpiece. Locate the average width of cut on the chart. Select the tooth Ditch on the ring marked with the tubing and structural shape which aligns with the average width you are cutting.

EXAMPLE: 4" (100mm) outside diameter, 3"(75mm) inside diameter tubing.

4" (100mm) OD = 12.5 sq.in. (79cm<sup>2</sup>)

3" (75mm) ID = 7.0 sq.in. (44cm<sup>2</sup>)

Area = 5.5 sq.in. (35cm<sup>2</sup>)

5.5 sq.in. (35cm<sup>2</sup>)/4" (100mm) distance = 1.38(35mm) average width

1.38" (35mm), use a 4/6 Vari-Tooth

**NOTE:** The band speed and cutting rate recommendations presented on this chart are approximations and are to be used as a starting point for most applications. For exact sawing parameters consult with your saw blade supplier.

### BI-METAL SPEEDS AND FEEDS

These figures are a guide to cutting 4"(100mm) material (with a 314 Vari-tooth when using a cutting fluid.

Increase Blade Speed:

15% When cutting 1/4" (6.4mm) material (10/14 Vari-Tooth)

- 12% When cutting 3/4" (19mm) material ( 6/10 Vari-Tooth )
  - 10% When cutting 1-1/4" (32mm) material ( 5/8 Vari-Tooth )
  - 5% When cutting 2-1/2" (64mm) material ( 4/6 Vari-Tooth )
- Decrease Band Speed:
- 12% When cutting 8" (200mm) material ( 2/3 Vari-Tooth )

### TELLTALE CHIPS

Chips are the best indicator of correct feed force. Monitor chip information and adjust feed accordingly. Thin or powdered chips-increase feed rate or reduce band speed.



Burned heavy chips-reduce feed rate and/or band speed.



Curly silvery and warm chips-optimum feed rate band speed.



### ASSEMBLY

A 1 HP, motor, split phase or capacitor-start is recommended for best economical performance. Counterclockwise rotation is required. Note that rotation can be reversed by following directions given on terminal nameplate.

- (1). Assemble the motor Mounting plate to the head, using the long bolt. Note that the flat side of the plate faces up.
- (2). Assemble the guard plate to the head using the screw and Lock Washer, and the Carriage Bolt Washer and Wing Nut are used to secure the motor mounting plate to the Guard plate through the slotted hole in the Guard plate. These components also serve to position and lock the motor in place for proper speed/ belt adjustment.
- (3). Place the spacer over the long Bolt and secure it with the nut.
- (4). Secure the Motor to the Motor Mounting plate with the four bolts and nuts. Note that the motor shaft is placed through the large opening in the Guard plate and must be parallel with the drive Shaft.
- (5). Assemble the Motor Pulley, the smaller of the two provided, to the motor shaft. Note: the larger diameter must be closest to the motor. Do not tighten the set screw.
- (6). Assemble the Driven Pulley, the larger of the two provided, to the protruding drive Shaft. Note: the small diameter must be closest to the bearing. Do not tighten the set screw.
- (7). Place the belt into one of the pulley grooves and the other end into the respective grooves of the second pulley.
- (8). Line up the belt and both pulleys so that the belt is running parallel in the pulley grooves.

- (9). Tighten the set screws of both pulleys in this position.
- (10). Place the belt into proper pulley combination for proper blade speed. See material cutting chart.
- (11). Adjust the position of the Motor to obtain approximately 1/2" depression in the belt when applying pressure with your thumb.
- (12). Tighten the head screw holding the Motor Mounting plate to the Guard plate.
- (13). Connect the Electrical Harness to the motor terminal box. The motor should be protected with a time delay fuse or circuit breaker with rated amperage slightly greater than the full load amperage of the motor.

## OPERATION

### Work set up

- (1). Raise the saw head to the highest position.
- (2). Open vise to accept the piece to be cut by rotating the wheel at the end of the base.
- (3). Place workpiece on saw bed. If the piece is long, support the end.
- (4). Clamp workpiece securely in vise.

### Work stop adjustment

- (1). Loosen the thumb screw holding the work stop casting to the shaft
- (2). Adjust the work stop casting to the desired length position.
- (3). Rotate the work stop as close to the bottom of the cut as possible.
- (4). Tighten thumbscrew.
- (5). DO NOT ALLOW the blade to rest on the work while the motor is shut off.

### Blade speeds

When using your Band saw always change the blade speed to best suit the material being cut. The material Cutting chart gives suggested settings for several materials.

Material	Speed F.P.M				Delt Groove Used	
	912(G.GDR)		912 (B.DR)		Motor pulley	Saw Pulley
	60Hz	50Hz	60Hz	50Hz		
Tool Stainless Alloy Steels Bearing Bronze	125	104	105	85	small	largest
Medium to High Carbon Steels Hard Brass or Bronze	255	212	196	184	Medium	Large
Low to Medium Carbon Steel			288	240	Large	Medium
Soft Brass						
Aluminum Plastic	380	316	377	12	Largest	Small

### Manual of gear type speed changing

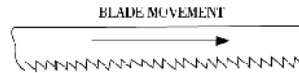
- (1) Select the proper cutting speed according with the material of work-pieces and blade select chart.
- (2) Turn the speed-changing handle directly for the necessary speed.
- (3) Changing speed during cutting is prohibited.
- (4) Changing speed when machine is stopped (before cutting)



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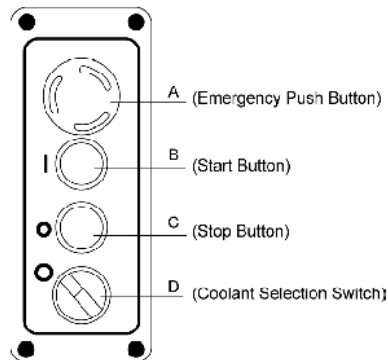
### Blade direction of travel

Be sure the blade is assembled to the pulley so that the vertical edge engages the work piece first.



### Starting saw

Switch button function description



**CAUTION:** Never operate saw without blade guards in place.

Be sure the blade is not in contact with the work when the motor is started. Start the motor, allow the saw to come to full speed, and then begin the cut by letting the head down slowly onto the work. Do not drop or force. Let the weight of the saw head provide the cutting force. The saw automatically shuts off at the end of the cut.

### Blade selection

A 8-tooth per inch, general-use blade is furnished with metal Cutting Band Saw. Additional blades in 4, 6, 8, and 10 tooth sizes are available. The choice of blade pitch is governed by the thickness of the work to be cut: the thinner the workpiece, the more teeth advised. A minimum of three (3) teeth should average to workpiece at all times for proper cutting. If the teeth of the blade are so far apart that they straddle the work, severe damage to the workpiece and to the blade can result.

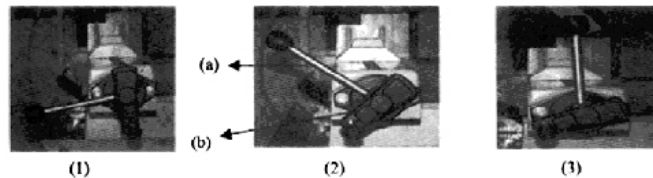
### Changing blade

Raise saw head to the highest position and open the blade guards. Loosen tension screw knob sufficiently to allow the saw blade to slip off the wheels. Install the new blade with teeth slanting toward the motor as follows:

- (1). Place the blade in between each of the guide bearings.
- (2). Slip the blade around the motor pulley (bottom) with the left hand and hold in position.
- (3). Hold the blade taut against the motor pulley by pulling the blade upward with the right hand which is placed at the top of the blade.
- (4). Remove left hand from bottom pulley and place it at the top side of the blade to continue the application on the upward pull on the blade
- (5). Remove right hand from blade and adjust the position of the top pulley to permit left hand to slip

- the blade around the pulley using the thumb, index and little finger as guides.
- (6). Adjust the blade tension knob clockwise until it is just right enough so no blade slippage occurs. Do not tighten excessively.
  - (7). Replace the blade guards.
  - (8). Place 2-3 drops of oil on the blade.

#### Tru-lock vise system instructions



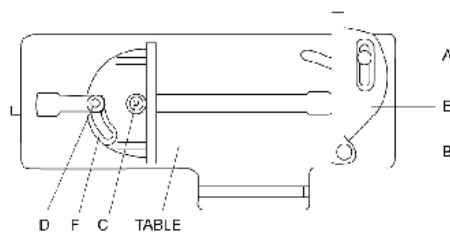
- (1). The position of the vise when tightened.
- (2). The position of the vise when loosened. (Half opened).
- (3). The position of the vise when loosened. (Completely opened).

#### To operate, proceed as follows

- 1) Raise the arm 2" above the workpiece, close the cylinder valve to maintain the arm 2" above the workpiece.
- 2) Put your workpiece on the table. Move the vise handle (a) upwards to an angle of 45 degree (a-half opened) to loosen the vise. Move the vise jaw bracket against the workpiece by turning the rectangular handle (b). Push down on the vise handle (a) to lock the workpiece in position.
- 3) To loosen the workpiece from the vise, hold the workpiece and lift the vise handle (a) to a 90 degree position (completely opened). Remove workpiece.

#### Quick vise adjustment for angle cut (912B. 912G)

- (1). Loosen the A. B. C. D. Screw.
- (2). Adjust rear vise to the threaded hole position. (E)
- (3). Set the scale to the desired angle.
- (4). Adjust the front vise (F) to parallel the rear vise (E)
- (5). Tighten the A. B. C. D. Screw.



#### Quick vise adjustment for angle cut(912DR. 912GDR)

- (1). Pull out plastic knob (A). Turn and lock the plastic knob.
- (2). Loosen grip (B). Then rotate the Body Frame for the desired angle. Be aware the blade position is higher than the vise table by pulling up the body frame when count-clockwise rotation for angle cutting and for clockwise rotation for angle cutting higher the Body Frame and keep the blade

- position higher than the vise. Then pull forward the vise Jaw Bracket (Front) to a proper location.
- (3). Fasten the grip (B) when the cutting angle is reached.
  - (4). There is angle set-screw for  $\pm 45^\circ$  rotation.



### BLADE GUIDE BEARING ADJUSTMENT

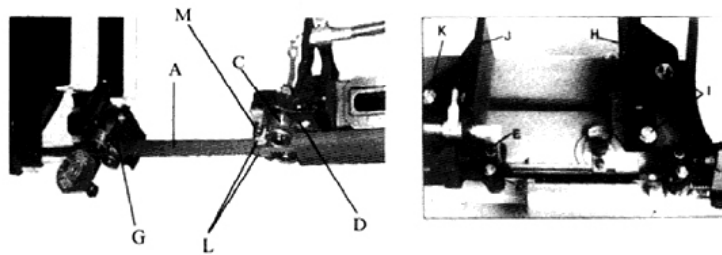
**ATTENTION:** This is the most important adjustment on your saw. It is impossible to get satisfactory work from your saw if the blade guides are not properly adjusted. The blade guide bearing on your metal Cutting Band Saw are adjusted and power tested with several test cuts before leaving the factory to insure proper setting. The need for adjustment should rarely occur straight, and if the situation is not corrected it will cause serious blade damage. Because guide adjustment is a critical factor in the performance of your saw, it is always best to try a new blade to see if this will correct poor cutting before beginning to adjust. If a blade becomes dull on one side sooner than the other, for example, it will begin cutting crooked. A blade change will correct this problem the guide adjustment will not. If a new blade does not correct the problem, check the blade guides for proper spacing.

**NOTE:** There should be from 000 (just touching) 001 clearance between the blade and guide bearings to obtain this clearance adjust as follows:

- (1). The inner guide bearing is fixed and cannot be adjusted.
- (2). The outer guide bearing is mounted to an eccentric bushing and can be adjusted.
- (3). Loosen the nut while holding to an eccentric bushing and can be adjusted.
- (4). Position the eccentric by turning the bolt to the desired position of clearance.
- (5). Tighten the nut.
- (6). Adjust the second blade guide bearing in the same manner.

#### Remark

- (1). Adjust the tension of blade until the back of the blade (A) against the blade wheel (front) lightly.
- (2). Be sure the nut (E) is tightened.
- (3). Turn the eccentric shaft (B) counterclockwise, when the bearing (D) touches the saw blade properly, tighten the nut (E).
- (4). To adjust, loosen set screw (F) and move the blade adjustable up or down until it lightly touches the back of the blade (A).
- (5). The carbide blade guides (L) Fig. 1, should also be adjusted so they lightly touch the blade by loosening screws (M).
- (6). Repeat 1, 2, 3, 4 and 5 steps to adjust the other side's blade guide bearings (G).
- (7). Correct the base and blade to be a vertical position with a scale. If necessary, loosen set screw (F).
- (8). Set down the blade frame, correct the jaw vise (H) and blade to be a vertical position with a scale then tighten the set screws (I).
- (9). Loosen set screw (K), move front jaw vise (J) to against rear jaw vise (H) tightly. Finish correcting by tightening set screw (K).



### BLADE TRACK ADJUSTMENT

- (1). Open the blade guard.
- (2). Remove the blade guide assemblies (top and bottom).
- (3). Loosen the hex head screw in the tilting mechanism to a point where it is loosen but snug.
- (4). With the machine running, adjust both the set crew and blade tension knob simultaneously to keep constant tension on the blade. The set screw and blade tension knob are always turned in opposite directions, ie, when one is turned clockwise the other is turned counterclockwise. The blade is tracking properly when the back side just touches the shoulder of pulley or a slight gap appears near the center line of the pulley. Care should be taken not to over-tighten the saw blade since this will give a false adjustment and limit life of the blade.
- (5). Tighten the hex head screw in tilting mechanism.
 

IMPORTANT: Sometimes in trying to make this critical adjustment it is possible to cause the basic setting to be misaligned. Should this occur, proceed as follows:

  - a. Loosen the set screw and back it out as far as it can go and still remain in the threaded hole.
  - b. Turn the hex head screw clockwise until it stops (do not tighten).
  - c. Turn the set screw clockwise until its bottoms, then continue for half a turn and check the tracking by turning on the machine.
  - d. if further adjustment is required, go back to step 4.
- (6). Turn off power to the machine.
- (7). Replace the blade guide assemblies—it may be necessary to loosen the blade tension alightly.
- (8). Adjust the vertical position of blade guide bearing assemblies so that the back side of the blade just touches the ball bearing.
- (9). Make a final run to check tracking. If required, touch up adjustment (see stop 4)
- (10). Replace the blade guards.

### Hydraulic Feed Adjustment

- (1). To adjust the feeding rate when in cutting. Turn the volume valve (A) clockwise for faster feeding.
- (2). When cutting feed is too fast, raise the saw arm, then slower the feed rate to prevent blade damage.

### MAINTENANCE

CAUTION: MAKE SURE THAT UNIT IS DISCONNECTED FROM THE POWER SOURCE BEFORE ATTEMPTING TO SERVICE OR REMOVE ANY COMPONENT.

That's easier to keep machine in good condition or best performance by means of maintaining it at any time than remedy it after it is out of order.

- (1) Daily Maintenance (by operator)
  - a. Fill the lubricant before starting machine everyday.
  - b. If the temperature of spindle caused over-heating or strange noise, stop machine immediately to check it for keeping accurate performance.
  - c. Keep work area clean; release vise, cutter, work-piece from table; switch off power source; take chip or dust away from machine and follow instructions lubrication or coating rust proof oil before leaving.
- (2) Weekly Maintenance
  - a. Clean and coat the leading screw been loose.
  - b. Check to see if sliding surface and turning parts lack of lubricant. If the lubricant is insufficient, fill it.
- (3) Monthly Maintenance
  - a. Check if the fixed portion have been loose.
  - b. Lubricate bearing, worm, and worm shaft to avoid the wearing.
- (4) Yearly Maintenance
  - a. Adjust table to horizontal position for maintenance of accuracy.
  - b. Check electric cord, plugs, switches at least once a year to avoid loosening or wearing.

## **LUBRICATION**

**Lubricate the following components using SAE-30 oil as noted.**

- (1) Ball-bearing none.
- (2) Driven pulley bearing 6-8 drop a week.
- (3) Vise lead screw as needed.
- (4) The drive gears run in an oil bath and will not require a lubricant change more often than once a year, unless the lubricant is accidentally contaminated or a leak occurs because of improper replacement of the gear box cover. During the first few days of operation, the worm gear drive will run hot. Unless the temperature exceeds 200F, there is no cause for alarm.

The following lubricants may be used for the gear box:

Atlantic Refinery Co. Mogul Cyl. Oil  
Cities Service Gptimus No.6  
Gulf Refinery Co. Medium Gear Oil

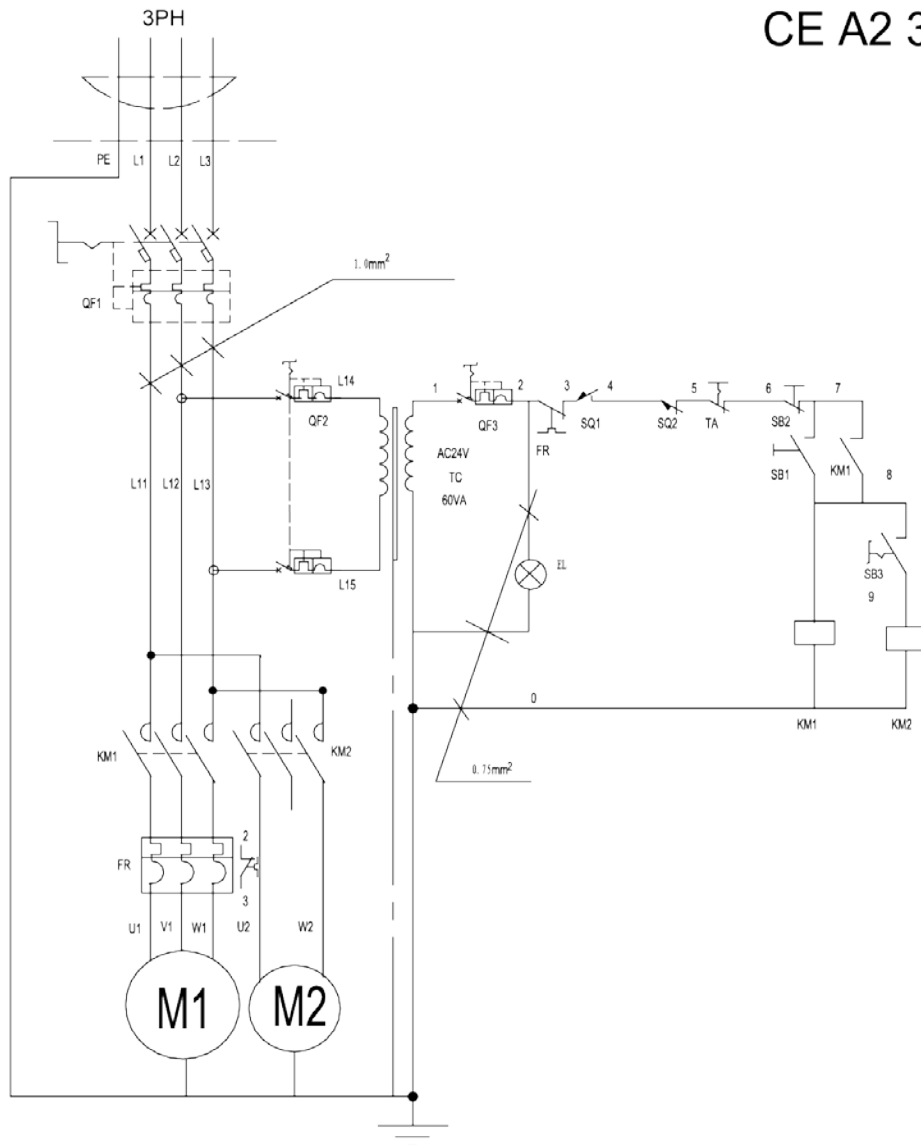
<b>Symptom</b>	<b>Possible Cause (s)</b>	<b>Corrective Action</b>
Excessive Blade Breakage	<ol style="list-style-type: none"> <li>1. Materials loosen in vise.</li> <li>2. Incorrect speed or feed</li> <li>3. Blade teeth spacing too large</li> <li>4. Material too coarse</li> <li>5. Incorrect blade tension</li> <li>6. Teeth in contact with material before saw is started</li> <li>7. Blade rubs on wheel flange</li> <li>8. Miss-aligned guide bearings</li> <li>9. Blade too thick</li> <li>10. Cracking at weld</li> </ol>	<ol style="list-style-type: none"> <li>1. Clamp work securely</li> <li>2. Adjust speed or feed</li> <li>3. Replace with a small teeth spacing blade</li> <li>4. Use a blade of slow speed and small teeth spacing</li> <li>5. Adjust to where blade just does not slip on wheel</li> <li>6. Place blade in contact with work after motor is started</li> <li>7. Adjust wheel alignment</li> <li>8. Adjust guide bearings</li> <li>9. Use thinner blade</li> <li>10. Weld again, note the weld skill</li> </ol>
Premature Blade Dulling	<ol style="list-style-type: none"> <li>1. Teeth too coarse</li> <li>2. Too much speed</li> <li>3. Inadequate feed pressure</li> <li>4. Hard spots or scale on material</li> <li>5. Work hardening of material</li> <li>6. Blade twist</li> <li>7. Insufficient blade</li> <li>8. Blade slide</li> </ol>	<ol style="list-style-type: none"> <li>1. Use finer teeth</li> <li>2. Decrease speed</li> <li>3. Decrease spring tension on side of saw</li> <li>4. Reduce speed, increase feed pressure</li> <li>5. Increase feed pressure by reducing spring tension</li> <li>6. Replace with a new blade, and adjust blade tension</li> <li>7. Tighten blade tension adjustable knob</li> <li>8. Tighten blade tension</li> </ol>
Unusual Wear on Side/Back of Blade	<ol style="list-style-type: none"> <li>1. Blade guides worn</li> <li>2. Blade guide bearing not adjust properly</li> <li>3. Blade guide bearing bracket is loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace</li> <li>2. Adjust as per operators manual</li> <li>3. Tighten</li> </ol>

<b>Symptom</b>	<b>Possible Cause (s)</b>	<b>Corrective Action</b>
Teeth Ripping from Blade	<ol style="list-style-type: none"> <li>1. Tooth too coarse for work</li> <li>2. Too heavy pressure; too slow speed</li> <li>3. Vibrating work-piece</li> <li>4. Gullets loading</li> </ol>	<ol style="list-style-type: none"> <li>1. Use finer tooth blade</li> <li>2. Decrease pressure; increase speed</li> <li>3. Clamp work piece securely</li> <li>4. Use coarser tooth blade or brush to remove chips</li> </ol>
Motor running too hot	<ol style="list-style-type: none"> <li>1. Blade tension too high</li> <li>2. Drive belt tension too high</li> <li>3. Blade is too coarse for work</li> <li>4. Blade is too fine for work</li> <li>5. Gears aligned improperly</li> <li>6. Gears need lubrication</li> <li>7. Cut is binding blade</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce tension on blade</li> <li>2. Reduce tension on drive belt</li> <li>3. Use finer blade</li> <li>4. Use coarse blade</li> <li>5. Adjust gears so that worm is in center of gear</li> <li>6. Check oil path</li> <li>7. Decrease feed and speed</li> </ol>
Bad Cuts (Crooked)	<ol style="list-style-type: none"> <li>1. feed pressure too great</li> <li>2. Guide bearings not adjusted properly</li> <li>3. Inadequate blade tension</li> <li>4. Dull blade</li> <li>5. Speed incorrect</li> <li>6. Blade guides spaced out too much</li> <li>7. Blade guide assembly loose</li> <li>8. Blade truck too far away from wheel flanges</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce pressure by increasing spring tension on side of saw</li> <li>2. Adjust guide bearing, the clearance can't be greater than 0.001</li> <li>3. Increase blade tension by adjust blade tension</li> <li>4. Replace blade</li> <li>5. Adjust speed</li> <li>6. Adjust guides space</li> <li>7. Tighten</li> <li>8. Re-track blade according to operating instructions.</li> </ol>
Bad Cuts (Rough)	<ol style="list-style-type: none"> <li>1. Too much speed or feed</li> <li>2. Blade is too coarse</li> <li>3. Blade tension loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease speed or feed</li> <li>2. Replace with finer blade</li> <li>3. Adjust blade tension</li> </ol>
Blade is twisting	<ol style="list-style-type: none"> <li>1. Cut is binding blade</li> <li>2. Too much blade</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease feed pressure</li> <li>2. Decrease blade tension</li> </ol>





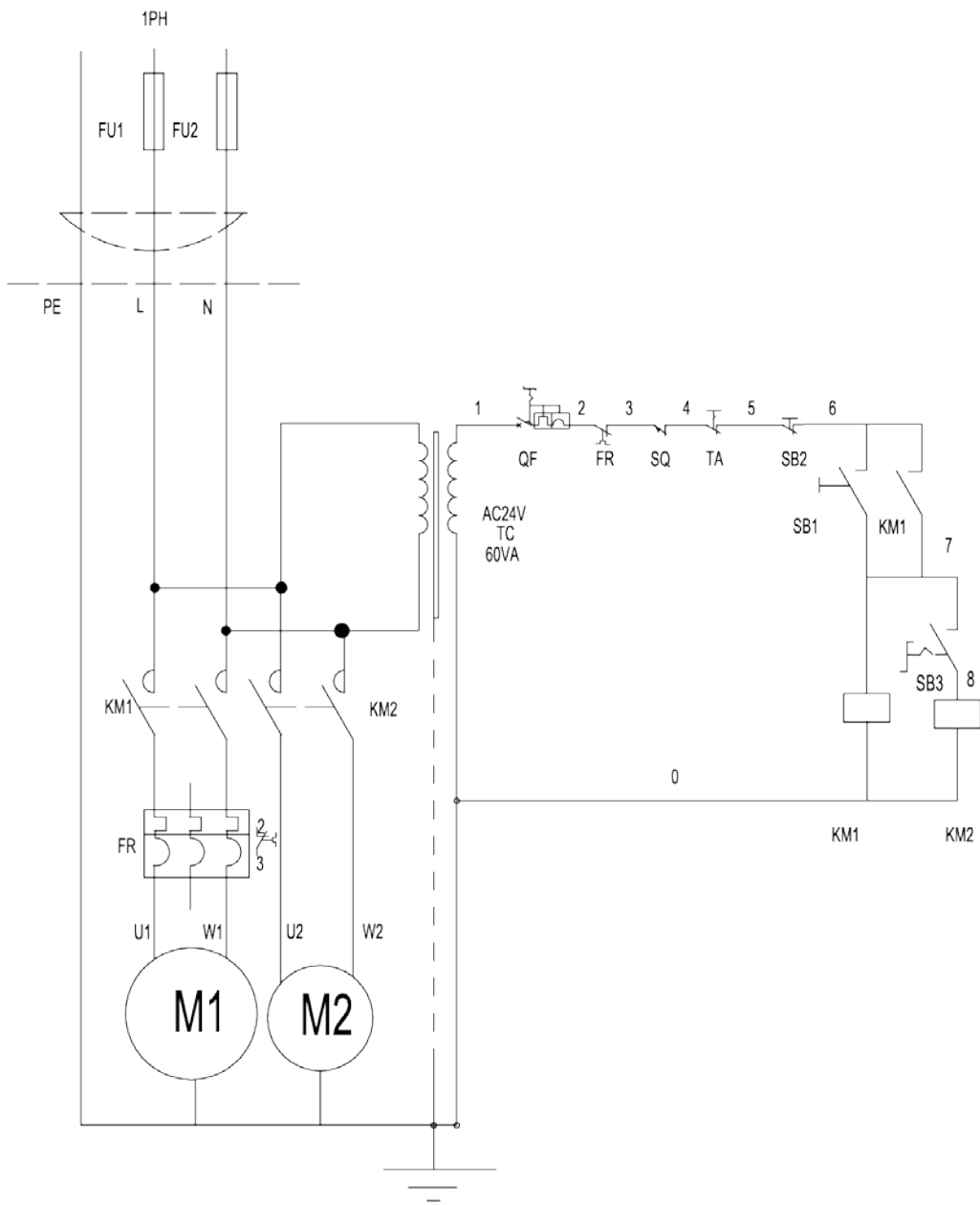
# CE A2 3PH



400V 50Hz 3PH A2 Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	50HZ 1420r/min 1.1kw 3PH	1
2	Coolant pump	M2	400/230V 50HZ 40W	1
3	Transformer	TC	AC400,230/24V	1
4	Current Breaker	QF	DZ47-63 3P 5A	1
5	E.S.P.	TA	XB2-BX542	1
6	Indicator light	EL	XB2-BVD3	1
7	Contactor	KM	CN-6 AC24V 50HZ	2
8	Heat relay	FR	RHN-5M 2.4-3.6A	1
9	Limit switch	SQ1	QKS7 250V 10A	1
10	Interlocking switch	SQ2	QKS8 250V 10A	3
11	Start	SB	XB2-BE101	1
12	Stop	SA1	XB2-BE102	1

# B1 1PH



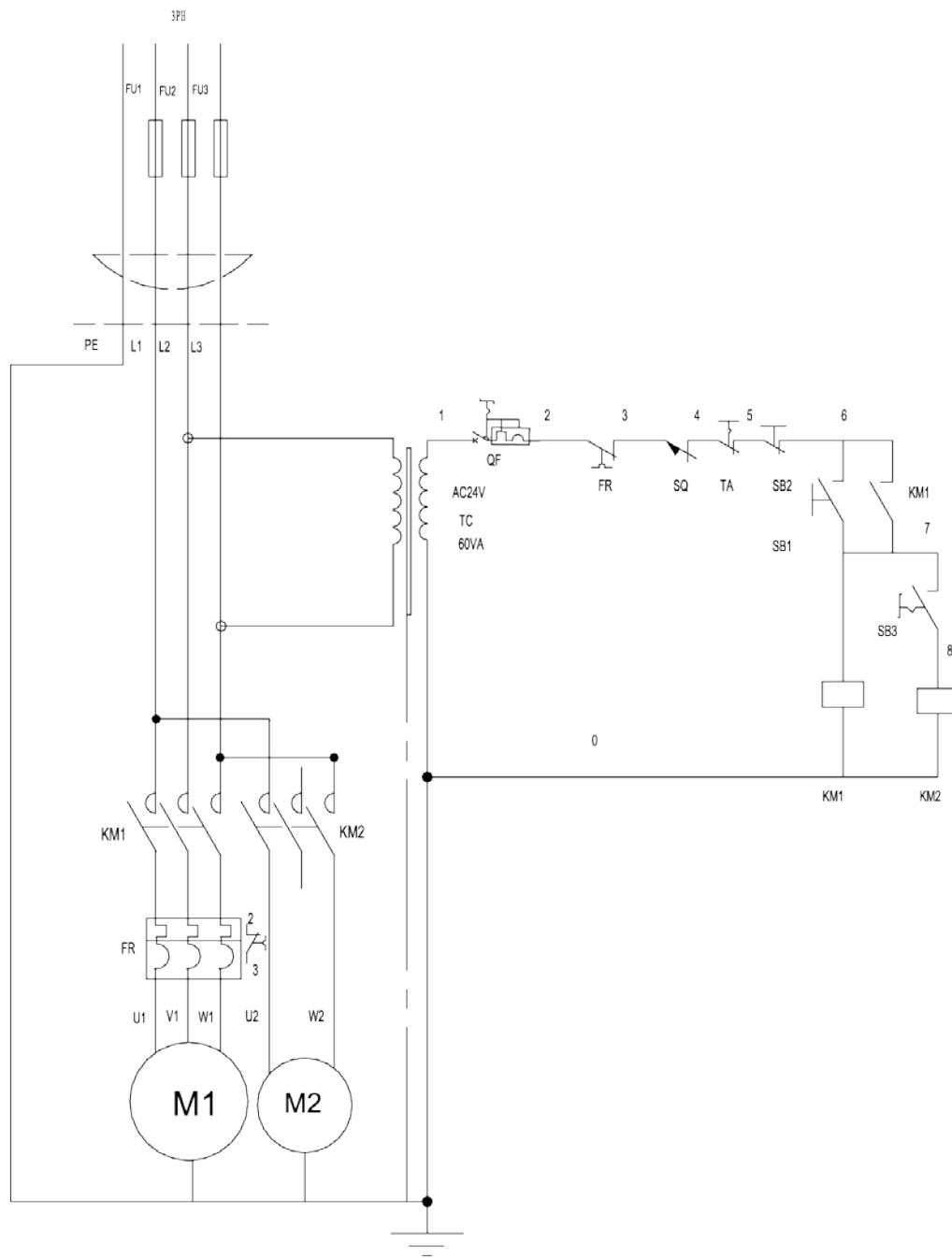
### 230V 50Hz 1PH B1 Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	50HZ 1420r/min 1.5kw 1PH	1
2	Coolant pump	M2	400/230V 50HZ 40W	1
3	Transformer	TC	AC400,230/24V	1
4	Current Breaker	QF	DZ47-63 1P 1A	1
5	E.S.P.	TA	XB2-BX542	1
6	Stop	SA1	XB2-BE102	1
7	Contactoer	KM	CN-9 AC24V 50HZ	2
8	Heat relay	FR	RHN-5M 8.5-12.5A	1
9	Limit switch	SQ1	QKS7 250V 10A	1
10	Start	SA2	XB2-ED21	1
11	Start	SB	XB2-BE101	1

### 110V 60Hz 1PH B1 Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	60HZ 1700r/min 1.1kw 1PH	1
2	Coolant pump	M2	220/110V 60HZ 40W	1
3	Transformer	TC	AC220,110/24V	1
4	Current Breaker	QF	DZ47-63 1P 3A	1
5	E.S.P.	TA	XB2-BX542	1
6	Stop	SA1	XB2-BE102	1
7	Contactoer	KM	CN-9 AC24V 50HZ	2
8	Heat relay	FR	RHN-5M 8.5-12.5A	1
9	Limit switch	SQ1	QKS7 250V 10A	1
10	Start	SA2	XB2-ED21	1
11	Start	SB	XB2-BE101	1

# B2 3PH



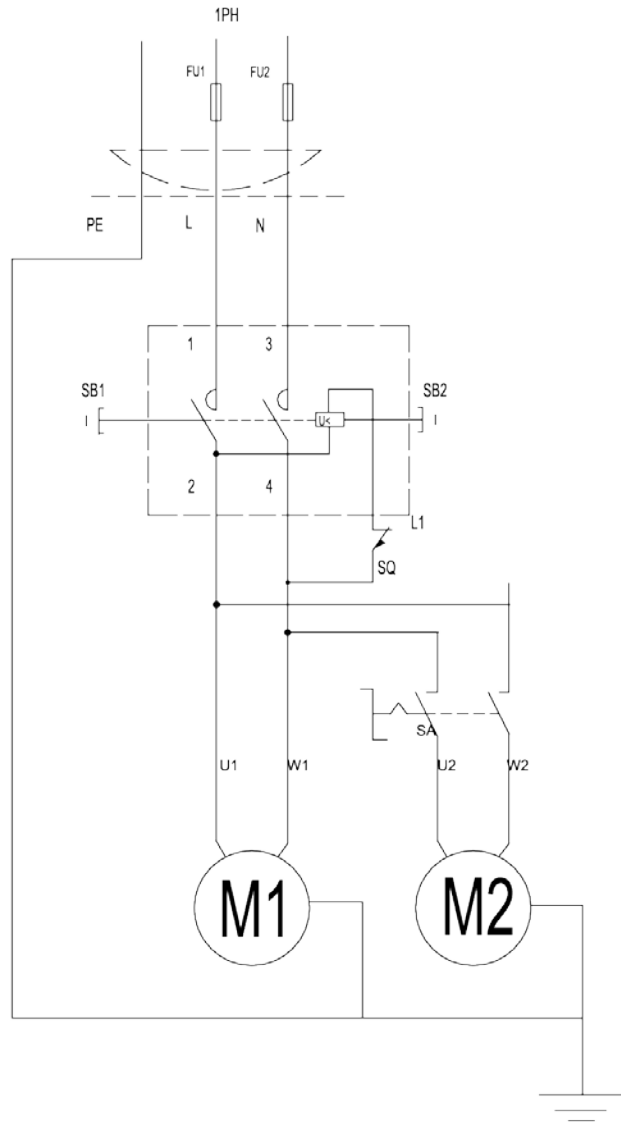
### 220V 60Hz 3PH B2 Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	60HZ 1700r/min 1.1kw 3PH	1
2	Coolant pump	M2	220V /110V 60HZ 40W	1
3	Transformer	TC	AC220/110V /24V	1
4	Current Breaker	QF	DZ47-63 1P 1A	1
5	E.S.P.	TA	XB2-BX542	1
6	Stop	SA1	XB2-BE102	1
7	Contactora	KM	CN-6 AC24V 50HZ	2
8	Heat relay	FR	RHM-5N 3.5-5A	1
9	Limit switch	SQ1	QKS7 250V 10A	1
10	Start	SB	XB2-BE101	1

### 400V 50Hz 3PH B2 Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	50HZ 1420r/min 1.1kw 3PH	1
2	Coolant pump	M2	400V /230V 50HZ 40W	1
3	Transformer	TC	AC400/230V /24V	1
4	Current Breaker	QF	DZ47-63 1P 1A	1
5	E.S.P.	TA	XB2-BX542	1
6	Stop	SA1	XB2-BE102	1
7	Contactora	KM	CN-6 AC24V 50HZ	2
8	Heat relay	FR	RHM-5N 2.4-3.6A	1
9	Limit switch	SQ1	QKS7 250V 10A	1

# C 1PH



230V 50Hz 1PH C Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	50HZ 1420r/min 1.1kw 1PH	1
2	Coolant pump	M2	400/230V 50HZ 40W	1
3	Electro magnetic switch	SB	CK5	1
4	Start	SA	XB2-ED21	1
5	Limit switch	SQ1	QKS7 250V 10A	1

110V 60Hz 1PH C Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	60HZ 1700r/min 1.1kw 3PH	1
2	Coolant pump	M2	220/110V 60HZ 40W	1
3	Electro magnetic switch	SB	CK5	1
4	Start	SA	XB2-ED21	1
5	Limit switch	SQ1	QKS7 250V 10A	1



### 400V 50Hz 3PH C Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	50HZ 1420r/min 1.1kw 3PH	1
2	Coolant pump	M2	400/230V 50HZ 40W	1
3	Electro magnetic switch	SB	CK5	1
4	Start	SA	XB2-ED21	1
5	Limit switch	SQ1	QKS7 250V 10A	1

### 230V 50Hz 3PH C Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	50HZ 1400r/min 1.4kw 3PH	1
2	Coolant pump	M2	400/230V 50HZ 40W	1
3	Electro magnetic switch	SB	CK5	1
4	Start	SA	XB2-ED21	1
5	Limit switch	SQ1	QKS7 250V 10A	1

### 220V 60Hz 3PH C Electric part list

No.	Name	Designation	Type&Specifications	Quantity
1	Main motor	M1	60HZ 1720r/min 1.1kw 3PH	1
2	Coolant pump	M2	220/110V 60HZ 40W	1
3	Electro magnetic switch	SB	CK5	1
4	Start	SA	XB2-ED21	1
5	Limit switch	SQ1	QKS7 250V 10A	1

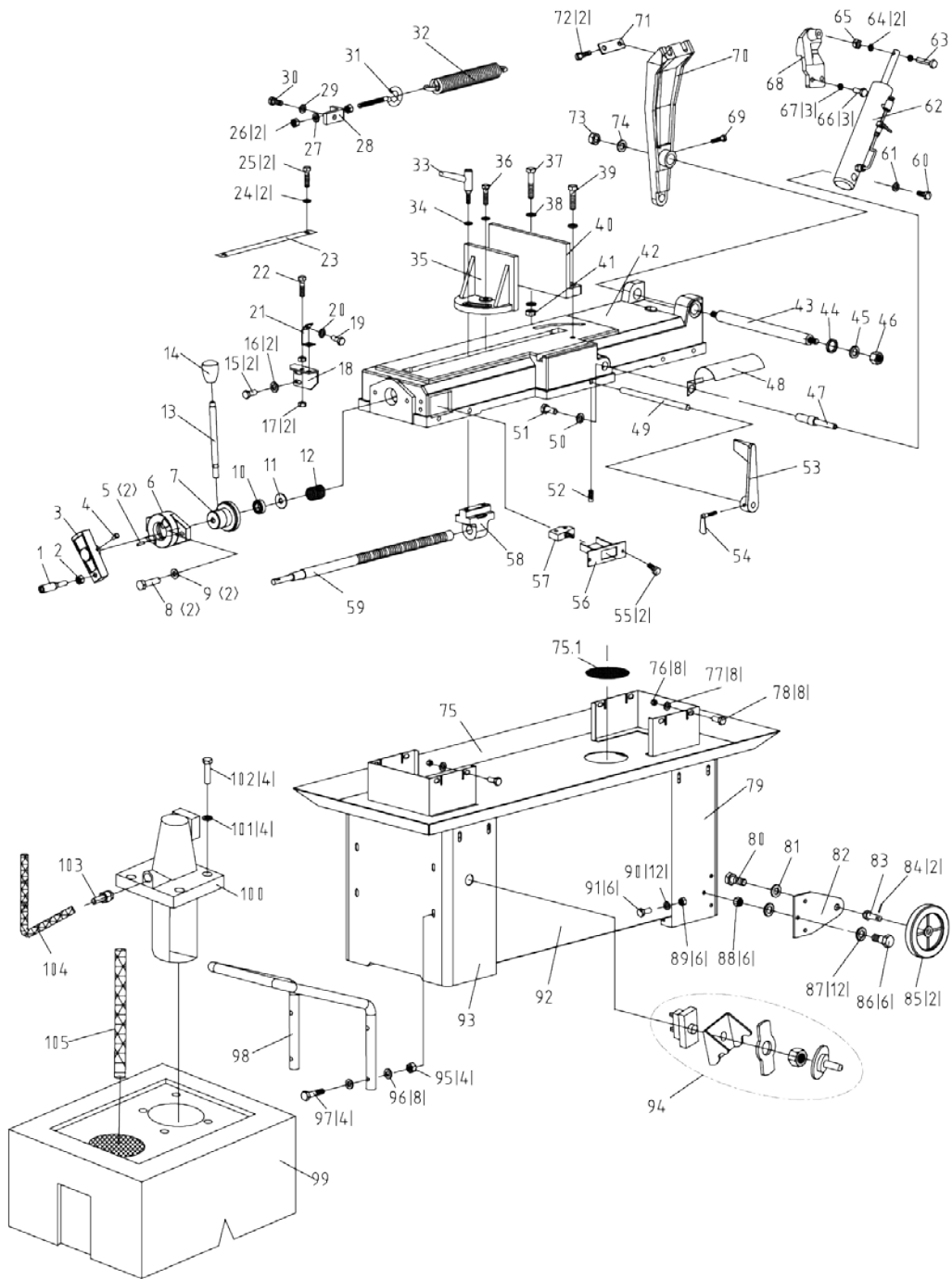


<b>Part No.</b>	<b>Description</b>	<b>Qty</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1	Turning handle M10X80	1	43	Rotor	1
2	Screw M10	1	44	Bushing	1
3	Handle bar	1	45	Big Washer 12	1
4	Bolt M6X12	1	46	Locknut M12	1
5	Pin 5X25	2	47	Support for cylinder	1
6	Speedy fixed block	1	48	Cover for cyinder	1
7	Speedy moving block	1	49	Shaft	1
8	Bolt M8X30	2	50	Washer 8	1
9	Washer 8	2	51	Bolt M8X20	1
10	Bearing 51101	1	52	Bolt M6X12	1
11	Sleeve	1	53	Handle seat	1
12	Spring	1	54	Handle assembly	1
13	Handle pole	1	55	Bolt M6X12	2
14	Sleeve for handle	1	56	Support for stop switch	1
15	Bolt M8X20	2	57	Stop switch	1
16	Washer 8	2	58	Screw	1
17	Screw M8	2	59	Screw	1
18	Trestle	1	60	Bolt M8X20	1
19	Bolt M8X20	1	61	Washer 8	1
20	Washer 8	1	62	Cylinder	1
21	Fixed board	1	63	Bolt M10X45	1
22	Bolt M8X30	1	64	Washer 10	2
23	Scale	1	65	Screw M10	1
24	Washer 4	2	66	M8X30	3
25	Bolt M4X10	2	67	Washer 8	3
26	Screw M10	2	68	Fixed seat for cylinder	1
27	Washer 10	1	69	Bolt M8X20	1
28	Fixed board	1	70	Pivot arm	1
29	Washer 8	1	71	Board	1
30	Bolt M8X20	1	72	Bolt M10X35	2
31	Drawing nail	1	73	Locknut M12	1
32	Spring	1	74	Big Bushing 12	1
33	Adjustable fixed handle M10X80	1	75	Tray	1
34	Sleeve	1	75.1	filter netting	1
35	Moving vise	1	76	Screw M8	8
36	Bolt M10X35	1	77	Washer 8	16
37	Bolt M12X50	1	78	Bolt M8X20	8
38	Washer 12	2	79	Support	1
39	Bolt M12X35	1	80	Bolt M10X20	2
40	Fixed vise	1	81	Washer 10	2
41	Screw M12	1	82	Truckle Board	2
42	Table	1	83	Truckle shaft	2

<b>Part No.</b>	<b>Description</b>	<b>Qty</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
84	Pin	2	126	Washer 6	4
85	Foot wheel	2	127	Bolt M6X20	4
86	Bolt M8X20	6	128	Eccentric shaft	2
87	Washer 8	12	129	Bearing 608-2Z	14
88	Screw M8	6	130	Washer on shaft 8	4
89	Screw M6	6	131	Shaft	2
90	Washer 6	12	132	Bolt M5X8	2
91	Bolt M6X16	6	133	Guarding plate	1
92	Board	1	134	Rear sliding seat	1
93	Stand	1	135	Mat	2
94	Coolant switch assembly	1	136	Stellate handle M10X35	1
95	Screw M8	4	137	Bearing 6205-2Z	2
96	Washer 8	8	138	Sleeve 52	2
97	Bolt M8X35	4	139	Idle wheel	1
98	Hold	1	140	Mat	1
99	Coolant box	1	141	Bolt M8X20	1
100	Coolant pump	1	142	Washer 6	2
101	Washer 6	4	143	Handle bolt M6X12	2
102	Bolt M6X12	4	144	Blade guard	1
103	Coupler	1	145	Fixing plate on cover	2
104	Hose		146	Washer 6	4
105	Aleak hose		147	Bolt M6X12	4
106	Complete switch button		148	Steering wheel	1
107	Bolt M10X45	2	148.1	Key 6X20	1
108	Washer 10	2	148.2	Mat	1
109	Bolt M8X20	4	148.3	Bolt M10X25	1
110	Washer 8	4	148.4	Blade 2655X27X0.9	1
111	Plate	2	149	Sleeve	1
112	sliding seat	1	150	Brush	1
113	Spring	1	151	Bolt M5X12	2
114	Block	1	152	Washer 5	2
115	Column pin	1	153	Front sliding seat	1
116	Shaft	1	154	Bolt M10X35	1
117	Turning handle M8X63	3	155	Nozzle support	1
118	Seat for handle	1	156	Coolant switch valve	2
119	Rod	1	156.1	Copper tube φ6	2
120	Washer 10	1	157	Bolt M8X30	4
121	Shaft	2	158	Washer 8	4
122	Screw M10	4	159	Saw bow	1
123	Washer 10	4	160	Bolt M6X12	1
124	Rear stand	1	161	Switch touching plate	1
125	Clamp block	4	162	Quadrate drawer A120	1

<b>Part No.</b>	<b>Description</b>	<b>Qty</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
163	Bolt M8X16	2	206	Washer on shaft 17	1
164	Shield leathern	1	207	Bolt M4X12	3
165	Big washer 6	2	208	End cover	1
166	Bolt M6X12	2	209	Bearing 6003-2Z	3
167	Joint 1/4"	3	210	Sleeve	1
168	Bolt M6X30	2	211	Seal 35X17X7	1
169	Joint block	1	212	Worm	1
170	Bolt M8X30	2	213	Key 5X45	1
171	Washer 8	2	214	Bolt M6X25	5
172	Bolt M8X25	4	215	Bolt	1
175	Seating board for motor	1	216	Bearing 6201	5
176	Screw M8	2	217	Gear for adjusting speed	1
177	Bolt M8X40	2	218	Output shaft	1
178	Motor	1	219	Key 5X80	1
179	Screw M8	4	220	Key	1
180	Washer 8	8	221	Washer 25	3
181	Key	1	222	Bearing 6205-2Z	2
182	Bolt M8X10	1	223	Adjustable washer	1
183	Belt cover	1	224	Fixed board	1
184	Motor pulley	1	225	Bolt M4X8	3
185	Bolt M8X20	4	226	Column pin 5X30	1
186	Washer 8	4	227	Poking board	1
187	Botton board	1	228	Pin	1
188	Belt A630	1	229	Spring	1
189	Handle bolt M6X12	1	230	Handle	1
190	Gear box	1	231	O-ring 6X1.8	1
190.1	Bolt M8X16	1	232	Shaft	1
191	Washer on shaft 25	1	233	Bolt M5X20	1
192	Bearing 80105	3	234	Seal $\phi$ 30X $\phi$ 42X7	1
193	Sleeve 47	2	235	Gear box	1
194	Seal 47X25X7	1	236	Gear shaft	1
195	Adjustable washer M10X80	1	237	Gear shaft	1
196	Output shaft	1	238	Key 6X20	1
197	Key 6X20	1	239	Worm gear	1
198	Worm gear	1	240	Washer 20	1
199	Washer on shaft 25	1	241	Seal mat	1
200	Seal mat	1	242	Column pin 6X25	2
201	Cover for gear box	1	243	Cover for gear box	1
202	Bolt M6X20	4	244	Worm	1
203	Bolt	1	245	Shaft	1
204	Bolt M6X10	2	246	Bolt M6X20	1
205	Worm pulley	1	247	Screw	1

<b>Part No.</b>	<b>Description</b>	<b>Qty</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
248	Vice	1	285	Board	1
249	Moving vise	1	286	Scale	1
250	Washer 10	1	287	Bolt M10X40	1
251	Adjustable fixed handle M10X80	1	288	Screw M10	1
252	Bolt M10X35	1	289	Bolt M6X25	2
253	Moving vise	1	290	Seat	1
254	Washer 8	3	291	Botton tray	1
255	Bolt M8X30	3	292	Bolt M8X25	4
256	Bolt M10X30	4	293	Tray	1
257	Washer 10	4	294	Upper plate of stand	1
258	Bolt M8X16	1	295	Block	1
259	Key 8X100	1	296	Screw M8	1
260	Bolt M8X25	6	297	Bolt M8X40	1
261	sleeve	2	298	Shaft	1
262	Rotative tray	1	299	Fixed seat	1
263	Screw	1	300	Bolt M8X25	2
264	Key 5X20	1	301	Washer 8	2
265	Turning handle M8X63	1	302	Middle plate of stand	1
266	Hand wheel $\phi$ 125X $\phi$ 15	1	302.1	Middle plate of stand	1
267	Vice	1	303	Washer 8	4
268	Key 8X70	1	304	Stretchy washer 16	4
269	Rotative tray	1	305	Bolt M8X25	4
270	Bolt M16X65	1	306	Lower plate of stand	1
271	Bolt 12X16	4	307	Screw M8	22
272	Spring	4	308	Washer 8	44
273	Shaft	4	309	Bolt M8X16	22
274	Rotative sleeve	1	310	Foot wheel	4
275	Stretchy washer 16	1	311	Foot wheel shaft	2
276	Washer 16	1	312	Pin 3X25	4
277	Capper	1	313	Shaft	1
278	Rotation	1	314	Hydraulic cylinder	1
279	Spring	1	315	Screw M12	1
280	Bolt for spring	1	316	Bolt M12X60	1
281	Screw M10	2	317	Breakwater	1
282	Fixed board	1	318	Bolt M6X12	2
283	Bolt M8X20	1	319	Washer 6	2
284	Adjustable fixed handle M10X80	1	320	Sleeve	2



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